

Ecological Politics

UM's Larry Brand flouts the grant system, pays the price

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On Saturday morning, December 1, 2001, Larry Brand parked his black Nissan pickup in the lot at the University of Miami's Rosenstiel School of Marine and Atmospheric Science. Brand's a professor there, hired as a phytoplankton ecologist in 1981, and tenured in 1987. During his two decades at UM studying the tiny, floating plants, Brand's life had become his work. He'd filled ten laboratories with thousands of dollars worth of equipment and hundreds of documents, studies, and surveys that he'd tucked away in a row of metal filing cabinets.

On that Saturday, Brand was carrying water samples he'd gathered in Big Cypress Swamp and the Everglades. He expected to filter the samples, then freeze them in one of the half-dozen fridges he had. Brand collects water samples all over the Glades and Florida Bay, and measures them for things like nitrogen and phosphorus, the microscopic particles that make up fertilizers. This seemingly innocuous work had become a nuisance for some of the most powerful businessmen and politicians in the state of Florida -- as we shall see. But Brand wasn't too worried back then. He was concentrating -- as he always does -- on the work, in an almost monkish way. He isn't so much a religious man as an altruist. He had a duty to look for the truth in these particles, which can cause as many problems as they solve. And as a scientist, he saw the data leading him toward that truth.

But on that Saturday morning, it was hardly about the data, and when he opened the door to his lab, reality hit him like a 50-foot tsunami. Everything was gone: \$100,000 worth of equipment, test tubes, beakers -- all his papers. His face flushed and his throat dried. "I was horrified," he would say later. There was no note to tell him where the equipment had been taken, no notice about whom to speak with concerning the missing documents. Nothing.

Confused, Brand asked around the Rosenstiel. Some people said they'd seen maintenance men cleaning out his lab. Others said

they'd seen them throwing things into the huge metal trash bins just outside the facilities. Brand asked a maintenance man, who confirmed the stories -- they'd thrown his stuff in the trash.

By now Brand's mind was spinning. He could think of a lot of people who'd want to stop him from proceeding on his research. After all, he'd spent the last few years challenging one of the premises of the government's eight-billion-dollar plan to restore the Everglades. If proved right, Brand's work could conceivably slow or even stop the entire project's massive forward motion -- begun in December 2000, when Presidents Clinton and Bush, Jr., the Florida legislature and governor, the sugar industry, and environmentalists signed off on the biggest ecological restoration plan in the history of the world. He had spoken against parts of this plan on several occasions, and when he felt no one was listening, he'd put his findings on a Website. He'd always repeat the same thing: "It's all in the data." But suddenly, as he searched frantically outside his Rosenstiel labs for his lost equipment, he realized that it had little to do with the data. This was about the politics of Everglades restoration.

Larry Brand has always been a bit of an accidental tourist when it comes to his work. He's done research in volatile places like Kuwait, Peru, and Turkey. In the early 1980s he went to Nicaragua. The Sandinistas were in power; Reagan was arming the contras to fight the Ortega brothers' Marxist regime. Paranoia abounded, and the tall, skinny, curly-haired gringo arrived in Managua's airport with a bag full of equipment to test phytoplankton. The bag included a set of special, razor-sharp needles that can gather one single plant cell on their tips; the Nicaraguan authorities were aghast at these unknown "weapons." "They thought I was CIA," Brand said. Luckily Brand's host was able to talk his way into the room where the scientist was being held and explain his mission to customs officials.

Brand stumbled into a similar predicament with regard to the politics of Everglades restoration. In 1995 the National Oceanographic and Atmospheric Administration (NOAA), a scientific wing of the Department of Transportation and a funding giant in his field, gave him and two other scientists a two-year, \$184,000 grant to study the emergence of algae in Florida Bay.

Florida Bay is a shallow, 1000-square-mile estuary, a mix of salt and freshwater systems, at the base of the Everglades. Saltwater mangroves form its northern border and the Florida Keys its southern. Its grassy mud banks and mangrove islands are home to a wide range of species from conch to shrimp to lobster. It's an important spot for fishing and tourism; it helps support a \$59 million-per-year shrimp industry and a \$22 million stone crab fishery. As the depository for millions of gallons of fresh water streaming through South Florida, the bay is a fundamental part of the Greater Everglades ecosystem. If the Everglades is the system's mouth, Florida Bay is its stomach. As the watershed for this system, what happens upstream has a direct impact on the bay's ecological health.

Since the early 1980s, that health has been in decline. The lush seagrasses that spread over the bay died off and the once gin-clear water became murky; algae proliferated. Aside from the ecological effects algae can have on the estuary, masses of it, known as "algal blooms," have hampered some of the fisheries and diving schools operating in the area. In 1995, at the encouragement of some of his colleagues at NOAA, Brand started to look into the algae problem. It was the beginning of a long journey that would eventually lead him to the trash pile behind his lab.

Initial studies of Florida Bay focused on a lack of fresh water coming in from the Everglades, which some scientists believed had caused the bay to become "hypersaline." They traced the high salt conditions to decisions government agencies made to divert water away from its natural flushing area, Florida Bay, to allow development of South Florida's agricultural and residential areas. These scientists added that circulation in the bay was limited, in part due to manmade changes that enclosed the area (from the construction of the Flagler railroad in the early 1900s), in part due to fewer tropical storms in recent years. The lack of fresh water, these scientists said, led to a rise in salt and "stressed" the seagrasses. This caused a massive seagrass die-off, which released nutrients into the bay, which spawned the growth of the algae.

However, in what would be the beginning of a legendary battle, Brand disagreed with the "hypersaline" theory. After several years of research and a followup grant from NOAA, he argued that the seagrass die-off did not provide the nutrients for the algal blooms. Instead Brand said the source of one of the nutrients, phosphorus, had been in the bay for centuries and was natural to that area. But, he said, the source for the other nutrient, nitrogen, was the Everglades. More nitrogen in Florida Bay, Brand continued, meant more algae, i.e., more pollution.

Well, this may seem like a fairly harmless theory, but now Brand was getting into some dangerous territory. To prove his theory, he drew from data collected by the South Florida Water Management District showing that increased water flow into the bay corresponded to increased size of algal blooms. Then Brand made a leap that few would forgive. He said that when the sugar plantations drained the Everglades in order to grow sugar *they released nitrogen from the peat soil*. This excess nitrogen was the major source of the nutrients that caused the growth of the algal blooms in Florida Bay. The only way to stop this, Brand concluded, was to reflood the sugar plantations, i.e., *get rid of the sugar plantations!*

With those words, Brand was laying the groundwork for a lawsuit -- something the sugar industry, the state of Florida, and the South Florida Water Management District desperately wanted to avoid. What's more, Brand was talking about ruining a \$500 million state industry. His life would never be the same.

From the beginning, Everglades restoration has been a delicate balancing act among businessmen, politicians, engineers, managers, and scientists. But maintaining this equilibrium has been virtually impossible. Each responds to different masters. Each moves at different speeds, and each seeks different answers to the same set of questions. What a scientist calls a "hypothesis," a water manager may call a "policy decision." What a water manager calls a "policy decision," a businessman may call a "problem."

With his contention that nitrogen-rich water from the Everglades was the source of the algae, Brand was upsetting this balance.

For the government and some scientists, Everglades restoration was about the other nutrient, *phosphorus*, not nitrogen. Indeed the federal lawsuit settled in 1991 that led to the Everglades restoration effort stated that an overabundance of phosphorus from fertilizers streaming into the Everglades from the sugar plantations caused the growth of cattails, setting off a chain of events that slowly began destroying the delicately balanced plant and animal life. The suit, which claimed that Florida's state government and the South Florida Water Management District hadn't done enough to protect the environment, became the cornerstone of the Comprehensive Everglades Restoration Plan (CERP) signed into effect in 2000.

CERP said sugar plantations would have to greatly reduce the phosphorus in their wastewater. Only then would the Everglades system be restored. CERP also relied on a tenuous understanding that when it came to sugar growers, this was it: Phosphorus was the pollutant; the sugar plantations would attempt to clean up their wastewater; the scientists would work closely with the government and sugar to achieve this goal. But Brand destroyed this equilibrium with his nitrogen notion. "The Everglades restoration project focuses on phosphorus," Brand declared, "Which is great for the Everglades because that's what's causing the problems there. But in the Florida Bay, it's *nitrogen* that's causing the problem."

Brand wasn't the first to break the unofficial rules of Everglades restoration by talking about nitrogen. In fact the battle lines over this estuarine system were drawn long before Brand declared that the sugar growers needed to reflood their plantations in order to save Florida Bay. In the late 1980s a tall, portly coral reef specialist from Harbor Branch Oceanographic Institution in Fort Pierce named Brian Lapointe noticed a severe decline in the health of the reefs. Like the bay, the reefs are a multimillion-dollar industry drawing diving tourists from all parts of the world. Initially Lapointe pointed to the sewage and septic tanks he said were depositing nitrogen near the reefs. This nitrogen made way for the growth of algae, which led to diseases that killed off the coral, he said. Later he added that the source of the nitrogen wasn't just sewage, but also farmlands in the northern and

eastern Everglades. As they did for Brand, statements like these would inevitably lead to trouble for Lapointe, too.

In addition to their theories on sugar plantations and nitrogen, Brand and Lapointe have a lot in common. They're both romantics as much as scientists. They met some years before at the prestigious Woods Hole Oceanographic Institution on Cape Cod, Massachusetts, when both did research with aquaculture pioneer John Ryther. Ryther's attempts to turn sewage into food attracted young idealists like Brand and Lapointe. Ryther also did a case study of the impacts of nitrogen and farm runoff to coastal bays in Long Island. Not surprisingly, both Brand and Lapointe ended up in Florida fighting similar battles against some of the same enemies.

Lapointe's critics were many, but the most important was a Florida International University biologist named Ron Jones. Jones is a charismatic, outspoken scientist. Where many of his colleagues hesitate carefully before committing to positions, Jones will take firm, unequivocal stances. He's also media-savvy and understands that pithy quotes sell more than thesis statements. On the estuary question, Jones took the position that sugar plantations weren't to blame. Jones is an expert on nitrogen and says there's no data to prove a causal link between agricultural runoff and coral reef degradation. "I went into this wanting to show that nitrogen was causing the problems," Jones says these days. "But as much as I'd like to have my cake and eat it too, I can't, because the sugar industry is *not* causing this problem."

It's difficult to contradict him. Jones played a major role in the groundbreaking lawsuit that led to CERP. He testified for the federal government's case against the state of Florida, for allowing sugar plantations to pollute the Everglades with phosphorus. Back then he was on the ecology side, "against business as usual." And at the time, Jones's colleagues warned him that his stance against Big Sugar might put his career at FIU in jeopardy. But after Jones's side won the case on phosphorus, he became a hero. He got tenure, national fame, and a steady stream of funding to ensure that sugar would follow through on its promises to reduce phosphorus in wastewater. More

important, he became *the* scientist on restoration. "Ron Jones is a guru," says South Florida Water Management District official Mike Collins, who works with him these days. "He's really a genius."

Collins and governmental agencies like to work with Jones because Jones has sought to maintain the fragile equilibrium that holds CERP together. Jones, for instance, talks to the sugar growers and even once worked as a consultant to the sugar industry. He remains part of an oversight committee for CERP. His stature in matters like these also makes Collins's life easier. Following one agreeable scientist is easier than tracking the hypotheses of ten bickering biologists. And in the case of nitrogen, Jones gave the government an escape hatch; it could avoid more lawsuits, something that was critical to the state of Florida following the phosphorus debacle. Collins, who is the chairman of the district's resources advisory commission, says when he was appointed by Jeb Bush to his post, the governor gave him just a few instructions: "Try to keep the people from suing us and get the best science you can."

Lapointe, on the other hand, was a problem. Like Brand's later, his hypothesis that nitrogen was damaging the coral reefs would put the state at risk of another lawsuit. Florida had already lost one on phosphorus and was spending millions of dollars, along with the sugar growers, to clean wastewater. Neither of them could afford to lose another battle. What's more, from the beginning of Everglades restoration, sugar growers have made sure there would be no lawsuits that resembled the one about phosphorus. They know that cleaning phosphorus from the water is hard; cleaning nitrogen is technically impossible and certainly cost-prohibitive. In the late 1980s, for example, when much of the focus was also on cleaning Lake Okeechobee of the phosphorus-laden wastewater from sugar plantations, sugar lobbyists made sure the word "nitrogen" was deleted from the Lake Okeechobee Technical Advisory Committee (LOTAC) report. "The sugar cane people became extremely sensitive over nitrogen," remembered Herb Zebuth, an Environmental Protection Agency consultant who was a member of the advisory committee. "Under pressure from the sugar growers lobby, the

LOTAC removed 'nitrogen' from [the] report they sent to the governor."

Before long, two camps emerged. On one side was Lapointe, who sought to connect agricultural runoff, and specifically nitrogen, to the problems in the estuary. On the other was Ron Jones, who limited the problem to the phosphorus runoff in the Everglades itself. Both wanted the Glades restored, but each saw them through different lenses. During the nascent stages of the Everglades project in the early 1990s, the two competing scientists worked together on a technical advisory committee for the Florida Keys. But it was only a matter of time before things got ugly. "Brian Lapointe was causing all kinds of problems," Jones says now. "I was brought in to counter Lapointe." In fact a team of people were "brought in" to argue down Lapointe. They said he lacked the data to prove his hypothesis. And, in many cases, he did.

However, over the next few years, some of Lapointe's predictions bore out. For instance Lapointe correctly said that an increase in water flow through certain areas would correspond to massive coral reef die-off. He had a hard time proving a one-to-one correlation, but the timing of the two events is unmistakable: Following the highest outflows of fresh water into southwest Florida's estuaries in the early 1990s, 38 percent of the coral reefs died. According to Lapointe, this "mass extinction event" has left just six percent of living coral.

"It was like a fire raging out of control," Lapointe says now. "I couldn't sit around and watch everything die around me." Shortly thereafter, Lapointe resigned from the oversight committee, then says he was blackballed by those who stayed on. He hasn't served on any committees since and has had difficulty getting funding to continue his studies in those areas. "This was all based on politics, not science," Lapointe maintains.

Lapointe was banished, but Jones flourished. In 2000 the National Science Foundation gave FIU a six-year, \$4.2 million grant to set up the Long Term Ecological Research center to monitor Everglades restoration. And Jones continues to defend his thesis that Big Sugar has nothing to do with the decline of the

estuary. "The only reason that this isn't a bad dream that won't go away is because this is keeping the funding up," Jones says.

Larry Brand is the antithesis of Ron Jones. The 49-year-old doesn't like to talk about himself and has trouble presenting his data in short, concise bursts for the press. Keeping up appearances isn't what he sees as part of his job. He's a researcher, a lab rat. He's about six feet tall and looks like a lone pine. His curly hair floats out around his mostly bald head like cumulus. He's clean-shaven, but usually wears jeans, dirty old trekking shoes, and beat-up shirts to work. He says he's had about fifteen students study with him at UM, but does the majority of his work alone.

By all accounts, Brand is as much a recluse away from Rosenstiel as in it. When he's not at the office, he's at his sprawling 1.2-acre home in South Miami working on his garden. "I like putzing around the house," he says. It's a huge project that keeps him busy. Brand isn't married and doesn't have children. He has flowers. His yard is full of heliconias, caladium, coleus, and, just for good measure, mother-in-law's tongue. "When I'm at home I like to pretend I'm not in the city," he says.

Brand grew up in Houston, where his father owned a printing press that put out phone books and materials for the oil industry. He was good in school, and by the time he entered the University of Texas at Austin in the early 1970s had developed a taste for science. "People were studying oceanography. It was a new frontier," he explains in his Texas monotone. Brand dove in. After finishing as an undergrad in Austin, he went to work with John Ryther at Woods Hole. Ryther's experiments with sewage bent the mind in ways that Brand loved.

These days he laughs at those experiments and calls himself "naive." But the biologist, who has long been a member of Amnesty International, has always sought to combine an element of justice with his career in science: "I guess it's a sense of obligation to the world. I have an education. I guess I should do something with it." Still Brand scoffs at the notion that he's a social activist. "Even with Amnesty International, all I'm doing is dealing with the truth."

When it came to Florida Bay, this quest for "truth" was getting him in trouble, and the politics of Everglades restoration was about to swallow him whole. As Brand would discover, dissent makes it tough to find funding because running against the current meant running against some of the main funders in his field: the South Florida Water Management District, the Army Corps of Engineers, even the National Oceanographic and Atmospheric Administration. NOAA and the district were putting money into the Jones camp at FIU not least because his group seemed to provide the path of least resistance: Its mantra remained "phosphorus, not nitrogen, was the pollutant." Scientists at Rosenstiel were getting money as well, albeit in smaller quantities. But Brand wasn't getting anything. In 2000 he gave another proposal to NOAA to study the sources of nitrogen flowing into Florida Bay. It was rejected, the first sign that he was being kicked out of the group. Brand scrambled and got some money from a smaller foundation on the East Coast, only half the NOAA amount.

With his funding grinding to a halt, Brand's position at Rosenstiel became shaky. The University of Miami put him on notice that he'd have to reduce his lab space. Scientific research centers depend on grant money to survive. In fact nearly 80 percent of the school's \$30 million-plus yearly budget comes from outside funding -- places like NOAA, the National Institutes of Health, the National Science Foundation, and the EPA. "I call them the mafia," Brand says about the Rosenstiel system of channeling all grant money through the university. "If you work with the mafia, they'll let you continue your business. But you have to give them their cut." The notice was the beginning of a long battle that would end with Brand sifting through the trash in search of his equipment.

Brand was losing the battle for public opinion as well. Attacks came from scientists at the South Florida Water Management District as well as other universities. They said Brand had made the same mistakes as Lapointe: He'd extrapolated but didn't have the data to back up his arguments that nitrogen could travel from sugar plantations to Florida Bay. "I have respect for Larry Brand," says Joe Boyer, an FIU biologist who's one of the

lead scientists on the Everglades restoration project. "[But] he's put forward a couple of whoppers, like [the one about] nitrogen."

Boyer, and many other scientists, say the nitrogen sources vary too much to be accurately traced. Nitrogen makes up nearly 80 percent of the air we breathe. It's also found in rain, groundwater, peat, plants, and fertilizers. Nitrogen goes through several cycles in which it changes from gas to liquid and back again. "Nitrogen cycling within the Everglades is quite complex," says Dave Rudnick, a lead scientist at the South Florida Water Management District and a Brand opponent on the nitrogen question. The nitrogen found in the Florida Bay could also be coming from farmlands or residential areas closer to the bay, like the Redland. The result is a very slippery debate with few definitive answers.

But, as it was with Brian Lapointe's arguments about coral reefs, behind Brand's hypothesis is a mountain of evidence showing that nitrogen from agricultural runoff is causing major ecological damage in estuaries around the world: the Adriatic Sea, the Venice Lagoon, the Baltic Sea, the Chesapeake Bay, the Black Sea, the Great Barrier Reef in Australia, the "dead zone" at the mouth of the Mississippi River. It's been shown that some of this nitrogen in the Gulf of Mexico's "dead zone" travels from as far away as farmland in Iowa to the end of the Mississippi. "About the only place where this isn't an acceptable hypothesis is in South Florida," says Lapointe.

Brand and Lapointe's positions weren't just scientifically unacceptable -- they were tantamount to heresy. "Frankly I don't understand the motivation," says Ron Jones of Brand's and Lapointe's hypotheses, "unless they don't want the Everglades restoration project to go through."

Lapointe had escaped, but Brand faced up to these critics. It wasn't pretty. At one meeting about Florida Bay in April 2001, South Florida Water Management District official Mike Collins attacked Brand so viciously, calling him irresponsible and damaging, that Scott Nixon, a member of the National Academy of Sciences, felt he had to stand up in his defense. "[Brand] put himself on the line and someone accused him of recklessness and

inappropriate behavior," said Nixon. "I got the feeling that people were influenced more by personal than scientific differences."

To this day Collins is unapologetic. "I sat and watched this crap go on for ten years," he says. "But at some point someone has to make a decision. I can't tell the taxpayers that you're going to pay another ten million dollars for research. I'm sorry. Florida Bay doesn't *have* another ten years."

Collins has since authorized the project to move forward with a plan to pump more fresh water into Florida Bay. More fresh water, a team led by Ron Jones argued, would mean less salt, less seagrass die-off, less algae. This was the exact opposite of what Brand and Lapointe had argued the district must do; they said the plan would lead to more algal blooms. But it didn't matter. Science had had its chance. Now it was the government's turn. And the government had decided who *its* scientists were. The Brands of this world were just getting in the way.

3. After that meeting, things went from bad to worse for Larry Brand. The University of Miami told him he had to consolidate his lab space. Lab space is tight at UM, so Brand stalled. He argued that he had two active grants and needed the space to complete his obligations to the concerned foundations. Two months passed and Brand didn't vacate, so the administration told him again. Brand and an administrator at Rosenstiel exchanged hasty communiqués in which each stated their cases: The university claimed it needed the space urgently; Brand asked for a little more time. That's when Brand went to collect samples from Big Cypress Swamp and the Everglades, returned, and found his nightmare had begun.

One can only imagine the horror he felt the day he saw his decimated lab. It was his work, his life gone. A million things must have run through his head. Brand is a romantic, not stupid. He understood he was upsetting government officials like Mike Collins. He also knew he was a pariah in the scientific community. But the attacks on his lab had upped the ante, and Brand could only guess why.

Certainly Big Sugar was upset with him. At UM, powerful sugar growers were within earshot. Alfonso Fajul, Jr., for example, the owner of the giant Florida Crystals, is a member of the board of trustees at the university, and is known to throw his political weight around. In 1996 Fajul called President Clinton to complain about a tax on sugar that Al Gore was proposing. A White House intern named Monica Lewinsky bore witness to the call; the Everglades bore the brunt. The tax proposal was shelved. Then Fajul threw \$23 million at state legislators to make sure a sugar tax to help pay for Everglades restoration wouldn't happen in Florida either. Of course, it didn't.

In fact if anything has become clear in the last few weeks, it's that sugar remains an obstacle to Everglades restoration. Last month, at the behest of lobbyists, Jeb Bush signed a bill that granted greater flexibility to the requirements that sugar growers must meet as they clean phosphorus from wastewater. It also extended the timeline within which the plantations must meet these pollution standards. The law threatens to derail the fragile alliance between environmentalists and lawmakers that helped make the Everglades restoration a possibility in the first place. More important, the alterations may affect four billion dollars in federal funding. Florida and Washington split the eight-billion-dollar price tag, and Washington has made clear that it doesn't like what sugar lobbyists have done to the cleanup efforts.

But whatever the reason for the eviction, Brand's life at Rosenstiel would only get harder after the fateful Saturday. The next few months involved a flurry of e-mails, angry words, and even threats. Brand slowly recouped his materials, but he still doesn't know where some of his computer disks and documents are. In January and February 2002, the unwonted moving continued. Maintenance men took his stuff from three chemistry labs and two "wet" labs where Brand had samples and cultures. He oversaw most of this but became frustrated with how careless the movers were. On one occasion, Brand got but an hour's notice of their arrival. On other occasions, he returned to his lab to find locks on his cabinets picked open, materials missing, fridges unplugged, samples ruined.

"For a while I was getting really paranoid," Brand says now. "I felt like they were just waiting for me to leave so they could move my stuff."

There was good reason to worry. He wasn't there for one of the bigger moves in early 2002. A maintenance man who says he saw his colleagues throwing away most of the equipment they found in order to clear out the office before Brand returned. Brand charges that to do the job even faster, movers used axes to destroy air pumps, tubing, and light banks that he'd used to grow cultures as part of a one-million-dollar National Institutes of Health study on anti-cancer and anti-HIV compounds found in algae.

The administration's aggressive behavior caught the attention of at least one maintenance man who called it "an obvious kick in the balls." Some of Brand's colleagues were also flabbergasted. The current department chair of Marine Biology and Fisheries, Sharon Smith, said Brand's case "was not dealt with in a professional way.... It was poorly handled." Before she was chair, Smith wrote to administrators calling the "attack on Larry Brand despicable."

Among his colleagues, there were rumblings of a "conspiracy" to oust Brand. But culpability varied according to whom you spoke with. Brand was known as a congenial colleague but a complainer. Others knew of Brand's contentious research regarding Florida Bay, but few were ready to leap to any conclusions. Smith, for example, says she knows nothing of a sugar growers' conspiracy to purposely slow Brand's work. Another colleague, who wished to remain anonymous, simply commented, "Just because you're paranoid doesn't mean it's not true."

In any case Brand's colleagues are steering clear of the politics hovering over the embattled iconoclast. But it's hard. "Politics have very much entered into the game," said Liana McManus, a marine biologist at the school. "Nobody is completely neutral. He [Brand] also has his own set of filters.... [But] there are forces that overcome the objectivity of science. And the reality is that he's been marginalized in this debate."

Rosenstiel's dean, Otis Brown, is also perfectly aware of the political forces at work. "Sometime in the last ten or fifteen years, science has shifted from being a watcher to a player," he said at a meeting in his office recently. But Brown, who has the last word on these matters, denies that politics had anything to do with management decisions in Brand's case. He says Brand's funding was dropping while others' needs were increasing. Brown adds that Brand didn't respond to repeated attempts by the administration to remove his equipment, so the university was obligated to do it for him. "I don't know whether it was [that] he was going to ignore it or he felt they didn't really mean it or what," Brown said. "I don't know what he was thinking. But the long and the short of it was that as time compressed, as space issues compressed, yes, there had to be more direct approaches made."

In fact, Brown says, if anything, he's shielding his scientists from the evil political chicanery of South Florida. "We can't have a specific agenda when it gets into these sorts of discussions," he explains, "because then we're just one more political pressure group working out there rather than being a trusted provider of fact, or a sense of how something works. That's what I think that our role has to be, and I'm doing my darndest to make sure people can do that."

Brown adds that he's never had any contact with the board of trustees or high-level administrators in Brand's case or any other case. "The Fanjuls have never talked to me about this. And I've never had any of their intermediaries talk to me either," he says. "If I felt that was driving the agenda of this school, I wouldn't be dean."

The Fanjuls did not return repeated calls for comment.

4. Brand struggles to look busy these days. The scientist now has three labs and an office at Rosenstiel, a third of the space he once occupied. Most of his equipment is in storage on Dodge Island or in different metal containers around the facility. The metal roofing of one of the containers collapsed on his equipment, so Brand and the maintenance men have propped up some wood girders to keep it upright. Brand says the limited

space makes it impossible for him to take on graduate students or argue for funding for large projects. The consolidation, he complains, has effectively crippled his research on Florida Bay as well. At Rosenstiel he often looks as he might in his 1.2-acre house: putzing around, fiddling with plants.

Brand says he's suing the university. The space he retains is in disrepair. In one small lab he has no working electrical outlets, forcing him to run an orange extension cord from a \$100,000 spectrofluorometer -- which helps him measure compounds in algae -- to a separate room to operate the machine. The ceiling has missing tiles, leaving electrical wires exposed. And to top things off, despite all the urgent need the administration said it had for his old space, the school has done little: Three of his labs now house grad students who use them for offices. Two other labs make up a private graphics design company. The university insists it is maximizing the use of space for *all* its employees and students, so this is normal.

In the meantime Brand keeps plugging his hypothesis about the sugar plantations being the source of the nitrogen that is polluting Florida Bay. Despite constant attacks and snickering, he continues to participate in Florida Bay and Everglades meetings, although he's no longer asked to present data. Still there are signs that his research is having an impact. Even if neither will fund his projects, both NOAA and the South Florida Water Management District have projects testing some of his theories. Representatives of both agencies said they'd like to see him working with them more closely. Brand laughs at their cynicism but holds his tongue. He knows that momentum is starting to shift back to him.

Last year the National Academy of Sciences, the most respected independent science board in the country, issued a report on Florida Bay. Like Brand and Lapointe's findings, the report cast doubt on the assertion that high salt content in the bay killed off the seagrass, which led to the algae. It also questioned the wisdom of sending more fresh water into the bay since it may contain the very nutrients, like nitrogen, that may be causing the algae. "The higher natural or anthropogenic loadings of nitrogen and, perhaps, phosphorus that may accompany increasing

freshwater fluxes from Shark River Slough," the academy wrote, "could potentially increase the frequency, intensity, and duration of phytoplankton blooms in regions of the Bay where these waters mix."

The report hit the Jones and Collins camp like a bomb. "They should never have been involved to begin with," says Jones, who disputes the academy's findings that reopen the debate on nitrogen. Collins was much more adamant about his feelings: "The NAS report, that was *horseshit*, that paper they produced," he fumes. "They should be shot." Collins said he respects the academy's work except with regard to the Everglades restoration project. "What they've done is totally unethical."

And so, along with Lapointe and Brand, the National Academy of Sciences has joined the list of heretics. Brand simply smiles at the irony. "The National Academy of Sciences report saved me," he says.

When Brand does speak in public now, it's usually to small audiences. At a recent meeting of the Friends of the Everglades in a conference room at Fairchild Tropical Garden in Coral Gables, Brand was the keynote. FOE is a small but willful group of people; when it doesn't get its way, it usually sues. This tactic helped put the original lawsuit against the state government and the South Florida Water Management District on the table. It may do so again over the Florida Bay question.

With the Friends in front of him, Brand felt at home. He talked freely about Washington's nefarious deal to "subsidize" Big Sugar in order to bring Cuba's Castro to its knees since sugar was the lifeblood of Cuba's economy. He then tried to explain his complicated theory about nitrogen, the Florida Bay, and the sugar plantations. At times his audience seemed to be lost. Some pressed Brand on the phosphorus issue, which prompted him to explain: "Phosphorus is the problem in the Everglades. *Nitrogen* is the problem in Florida Bay." Afterward, though, they were back on the same page. Brand was surrounded by Friends members who scoffed at Big Sugar's interests and the government's complicity. Brand laughed with them, then repeated his familiar refrain: "All you have to do is look at the data."