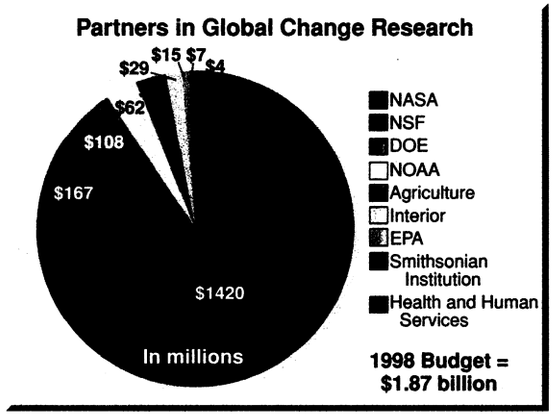
are not a possibility. "They also told us to take a hard look at the program [to decide] what's in and what's out," says Goodrich.

In response, program officials are assembling five groups to review global change priorities and set criteria for inclusion in the proposed 2000 budget that is to be compiled in the fall. A draft plan will be readied by 15 August and submitted to the White House 2 weeks later. The goal is to plug research gaps, eliminate overlap, and coordinate the work of the various agencies.



NASA will lead a group examining global change observations, including the balance between satellites and a NOAA ground network that in some cases "is decaying pretty badly," says Goodrich. Those instruments, notes the NRC report, also require better calibration to avoid contentious debates over data comparisons. A DOE-chaired panel will consider modeling needs. "There must be a considerably expanded commitment of resources to modeling" and to the advanced computing necessary to build better models, the NRC study states. A third panel, headed by the Department of Agriculture, will look at ecosystem issues, while a fourth, led by Interior, will focus on the carbon cycle. A fifth DOE-led team will examine ways to link seasonal and interannual climate change with longer trends.

Program managers admit they are a long way from being able to come up with clear and identifiable measures of their progress, and that working in a more coordinated fashion is easier said than done. "There is tremendous potential for coordination, but that hasn't yet come to fruition," adds Ghassam Asrar, NASA earth sciences chief.

Despite those hurdles, program critics say the initial response to their concerns makes them optimistic that the situation will improve. "At the retreat, I felt they were more or less heading in the right direction," says Moore. Bierbaum says she feels that program officials are responding properly, and another White House official called the actions "a good step." So while global climate change managers and researchers keep an eye on future El Niños and other climate phenomena, their efforts are certain to be watched closely by their political and scientific colleagues.

–Andrew Lawler

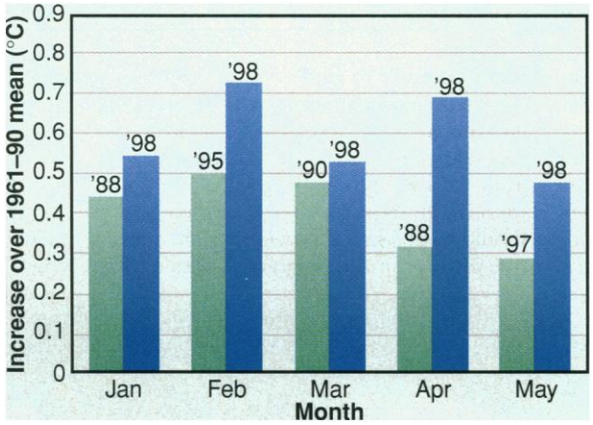
GLOBAL WARMING

Hot Year, But Cool Response in Congress

Boosted by El Niño, 1998 is in the lead position to be the warmest year of the millennium. Vice President Al Gore and scientists from the National Oceanic and Atmospheric Administration (NOAA) announced on 8 June that the global average temperature "far exceeded" previous records for every one of this year's 5 months. Although El Niño has been waning in the last few weeks, scientists say the heat so far is enough to make 1998 a very good bet to surpass 1997, the current record holder (*Science*, 16 January, p. 315).

Gore used the NOAA data as ammunition in the Administration's uphill battle to convince a reluctant Congress to back its efforts to reduce greenhouse gases. "This report is a reminder once again that global warming is real and that unless we act, we can expect more extreme weather in the years ahead," he said during a hastily organized meeting of the White House that included NOAA chief James Baker and leading global change researchers.

Most climate researchers agree with Gore that a gradual warming trend contributed to this year's heat and that if 1999 turns out to be cooler, it is only because it will lack an El Niño. Defined by unusually warm surface waters in the tropical Pacific, El Niños typically lead to warmer-than-average global temperatures. But this year's was exceptional. Based on measurements from weather stations, satellites, ships, and buoys, NOAA researchers calculated that combined land and ocean temperatures were 0.25 degrees Celsius warmer than in any previous recorded January-through-May period. It was the hottest spring in a decade that tree rings and other indirect evidence suggest is the hottest of the last 1000 years. The jump is well outside the 0.05 degrees of estimated error in such global averages, implying that the warming is real, says climatologist Philip Jones of the University of East Anglia in Norwich, England.



Unbeatable. Global average temperature has exceeded the previous record (crosshatched bars) in every month so far this year.

The NOAA report also suggested that global warming might be exacerbating El Niño's effects on weather. The underlying warming provides extra energy for evaporation, says atmospheric scientist Kevin Trenberth of the National Center for Atmospheric Research in Boulder, Colorado. That could both worsen droughts on land and also put more moisture into the air to strengthen storms and floods associated with El Niño.

But so far, bad news about global warming has not convinced Congress to act. Last week the Senate Appropriations Committee rejected the White House request to boost spending in 1999 on Department of Energy–funded research into cleaner, renewable energy sources. That move earned a rebuke from Gore: "It's time for Congress to wake up to the mounting evidence and help us meet this challenge head on." However, congressional staffers say that extraordinarily low gasoline prices make additional spending on alternative energy technology untenable.

Senate leaders have also made it clear that they will not even debate whether to ratify the Kyoto treaty signed by more than 150 nations last year, which would reduce greenhouse emissions. Industry executives and politicians from both parties worry that such reductions could harm economic growth.

The third leg of the Administration's global change strategy—the global change research program—is less controversial and is likely to reap the full $1.8 billion 1999 request, staffers say (see p. 1682). But the global heat wave seems unlikely to warm prospects for greenhouse spending on Capitol Hill.

–Gretchen Vogel and Andrew Lawler