

Fran Bagenal of the University of Colorado, Boulder, added that restoring money to those two areas would “justify a delay in flagships” such as the Solar Dynamics Observatory, to be launched in 2008 to examine solar variability.

Some flagship missions already have been delayed or canceled. A 2010 launch for NASA’s \$850 million Global Precipitation Measurement mission has been stretched to 2013, and NASA has twice canceled plans for a major spacecraft to study Jupiter’s moon Europa. “This marks the first time in 4 decades

when we have no solar system flagship at all,” noted Wes Huntress, a geophysicist at the Carnegie Institution of Washington and a former NASA space science chief.

That somber situation might look good to life and microgravity scientists, who would be largely shut out over the next 4 years of space station construction and perhaps longer. Before the Columbia disaster, NASA planned 28 shuttle flights, many carrying scientific equipment to and from the facility. Now the number stands at 16. “It is the same

space station,” Griffin said. “But we are largely deferring utilization.”

In good news for the station’s partners, NASA agreed to launch the European and Japanese scientific modules earlier than planned so that non-U.S.-based research could begin in 2008. In exchange for not launching a Russian power module, NASA also will funnel power to the Russian portion of the station. A portion of that power was once designated for experiments aboard the U.S. lab module.

—ANDREW LAWLER



Monumental price. The building of immense statues helped deforest Easter Island.

ARCHAEOLOGY

Dates Revise Easter Island History

When Dutch explorers landed on a remote Pacific island a few days after Easter Day 1722, they found eerie carvings of huge stone statues, a barren landscape, and natives with dwindling supplies of food and wood. Ever since, Easter Island, now known as Rapa Nui, has been considered a textbook example of a once-thriving culture that doomed itself by destroying its own fragile habitat.

Now a paper appearing online in *Science* this week (www.sciencemag.org/cgi/content/abstract/1121879) revises that story, implying that construction of the statues and degradation of the environment both began almost immediately after humans set foot on the island. New radiocarbon dates and a reanalysis of old ones put humans first on Rapa Nui at about 1200 C.E., 400 to 800 years later than previously estimated and just 100 years before the palm trees begin to vanish. “You don’t have this Garden of Eden period for 400 to 800 years,” says lead author Terry Hunt of the University of Hawaii, Manoa. “Instead, they have an immediate impact. The destruction-of-the-environment story is on steroids.”

Other researchers, such as archaeologist Patrick Kirch of the University of California, Berkeley, agree that the new dates raise serious questions about whether the Easter Island residents ever lived sustainably on the island. But some question the team’s dismissal of some older radiocarbon dates. “I’m not convinced they made the case for a later occupation,” says Kirch.

By the time the Dutch landed, the Easter Islanders—and the Polynesian rats that had stowed away in their canoes—had destroyed most of the subtropical trees and giant palms that provided wood for canoes and for transporting statues, as well as fuel for fire. The settlers also had wiped out many species of birds. But most researchers thought that there was a period during which the islanders had lived in harmony with the environment, before they taxed their resources with a complex culture and statue building. Earlier radiocarbon dates seemed to support that idea, suggesting colonization between 800 C.E. and 1200 C.E. and ecological collapse, as indicated by the disappearance of

palm trees, starting at least 400 years later.

Hunt and co-author Carl Lipo of California State University, Long Beach, took eight samples of wood charcoal from the bottom of the oldest known archaeological site on the island, called Anakena. When they got radiocarbon dates that clustered at about 1200 C.E., Hunt at first assumed the dates were wrong and put them aside. But later he and Lipo decided to scrutinize all earlier dates from Anakena, to make sure they did not contain carbon from marine organisms or old wood, which can skew dates too old. After discarding what they considered unreliable dates, the pair found a high probability (50%) for the first human settlement starting just after 1200 C.E. The evidence does not rule out an occupation at 1000 C.E., but the probability is very low, says Hunt. The new dates are a “significant improvement” over the old ones, says radiocarbon-dating expert Tim Higham of Oxford University, U.K.

Although several researchers welcome the rigorous analysis of dates, not everyone agrees with the criteria the team used. “Some of his criteria are fair; others are not,” says zoologist David Steadman of the Florida Museum of Natural History in Gainesville, whose 1000 C.E. dates for Anakena were left in the pair’s analysis.

The new results are in keeping with a trend in the past decade toward later dates for colonization of some of the outermost Pacific islands. “This is an important paper, because it is part of a revision on the chronology of the Pacific that shows there is a big gap between settling west Polynesia [e.g., Samoa] and the marginal areas of south and east Polynesia,” such as New Zealand, says archaeologist Atholl Anderson of the Australian National University in Canberra.

The new dates won’t be the final word on the first colonization of Easter Island, researchers say. “The chances you’re going to find the first campfire are pretty slim,” says Steadman. “It will enliven the debate and force everybody to take a critical look at their dates.”

—ANN GIBBONS

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