

Climate Outlook Looking Much The Same, or Even Worse

Climate scientists have been feverishly preparing analyses for inclusion in the fifth climate assessment report (AR5) of the Intergovernmental Panel on Climate Change (IPCC) due out in 2013. At the meeting, they gave colleagues a peek at where climate science stands 5 years after their last push to inform the authoritative international evaluation. The climate models are bigger and more sophisticated than ever, speakers reported, but they are yielding the same wide range of possible warming and precipitation changes as they did 5 years ago. But when polled on other areas of concern, researchers say they see more trouble ahead than the previous IPCC assessment had, though less than some scientists had feared.

“So far, there is really not any significant difference we can talk about” from the bigger, more realistic climate models being run for AR5, said modeler Claudia Tebaldi of climate think tank Climate Central in Princeton, New Jersey. Results from about one-third of the 30 or so models expected to be considered have been submitted. These models, at least, are only slightly more sensitive to added greenhouse gases than AR4 models were, Tebaldi said at the meeting. The two sets of models predict “very similar” geographic patterns of future warming and changing precipitation around the world. For extremes of temperature and precipitation, “the patterns are very similar, the ranges are very similar,” she said.

Modeling of other consequences of

global warming is still in its infancy, however. So for a preview of what IPCC may be projecting in those areas in its 2013 assessment, some researchers are falling back on expert judgment.

Glaciologist Jonathan Bamber of the University of Bristol in the United Kingdom asked experts how high the loss of glacial ice will drive sea level by 2100. In 2007, IPCC projected a 25-centimeter rise from ice sheet losses, but it was roundly criticized for not including the more speculative possibility of galloping glaciers draining away ice sheets even faster (*Science*, 8 June 2007, p. 1412).

So Bamber surveyed 28 colleagues, half of whom responded. Making judgments on how warm it will get and how ice sheets will react to that warming, the experts came up with a mean best estimate of 32 centimeters of sea level rise by 2100 from ice sheet losses, he said at the meeting. That puts their collective judgment distinctly above the IPCC’s conservative estimate but below some earlier estimates of a meter and more. Sea level rise from all sources—including mountain glacier melting and ocean water expansion—will surely continue and will accelerate, the experts conclude, until it reaches a total of 61 to 73 centimeters by 2100. That’s enough to inundate large parts of South Florida and Bangladesh, but it’s not the looming catastrophe foreseen by some.

Another expert elicitation presented at

Déjà vu. The latest climate models are calling for much the same global warming by 2100 as earlier simulations (*left*) did 5 years ago.

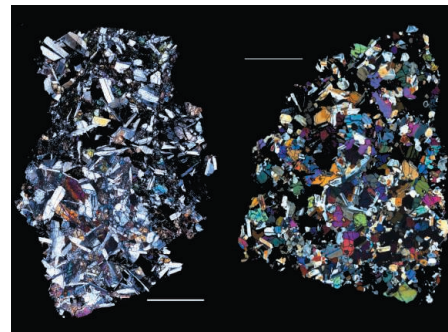
the meeting looked at how much greenhouse gases the warming might drive out of Arctic permafrost by 2100. Some headlines have had the Arctic gushing carbon dioxide and the far more potent greenhouse gas methane as the warming thaws Arctic ground (*Science*, 6 August 2010, p. 620). Permafrost researcher Benjamin Abbott of the University of Alaska, Fairbanks, and colleagues polled 43 permafrost and climate experts at a workshop last June. They judged that several times more greenhouse gases would be released by 2100 than models had been calling for. That would put it on a par with releases from current deforestation, though the resulting warming would be greater due to a higher-than-expected proportion of methane.

On balance, the talks in scattered sessions reassured researchers. The fancy new climate models aren’t revealing dramatically new climate vistas, and they aren’t blowing up either. And even with a dash of human judgment added, the broad outlook is not a great deal more disturbing than it already was.

A Vesta Core and a Magnetic Field, Too?

Dawn spacecraft scientists probing Vesta’s interior for the first time reported at the meeting that they had detected a metallic core to the rocky asteroid. And just as they were making the announcement, researchers speaking in an unrelated session reported hints of a magnetic field generated in the same core in Vesta’s earliest days, as Earth does today. Follow-up by Dawn, however, will be impossible.

Dawn deputy principal investigator Carol



Vesta up close. Through a polarizing microscope (2.5-mm scale bars), lava minerals dazzle.