

Behind the scenes of the IPCC report, with Stanford scientists

March 31 2014, by Rob Jordan



This shows Stanford scientists Chris Field, David Lobell, Terry Root and Noah Diffenbaugh were among the authors and editors who prepared the U.N. report on climate change. Credit: Paul Sakuma

In the summer of 2009, Stanford Professor Chris Field embarked on a task of urgent global importance.

Field had been tapped to assemble hundreds of climate scientists to dig through 12,000 scientific papers concerning the current impacts of

[climate change](#) and its causes.

The team, Working Group II, would ultimately produce a 2,000-page report as part of a massive, three-part U.N. Intergovernmental Panel on Climate Change (IPCC) Fifth Assessment Report, which details a consensus view on the current state and fate of the world's climate.

The job would take nearly five years, spanning time zones and languages, and requiring patient international diplomacy, dogged organizational discipline and a few napkin doodles. Marathon debates conducted over Skype crashed the service more than once.

"It's got lots of moving pieces, personalities and opportunities for things to go right or wrong," said Field, who co-chaired the effort. "You end up with a report that reflects the balance of understanding across the scientific community."

In addition to being a professor of biology and of environmental Earth system science, he heads the Department of Global Ecology at the Carnegie Institution for Science, and is a senior fellow at the Stanford Woods Institute for the Environment and the Precourt Institute for Energy.

This team conducted most of the work behind closed doors, but Field and other Stanford faculty members who played key roles shared a behind-the-scenes story of what it takes to generate the most comprehensive diagnosis of the health of the planet and the risks it faces.

Beginning the journey

For Field's group, the long road began in earnest at a July 2009 meeting in Venice, Italy, where 209 scientific experts and IPCC members from

around the world developed a chapter-by-chapter outline of the report. Their outline was later formally accepted at a meeting in Bali, Indonesia.

But before Field and his team could begin the heavy lifting of writing the report, they hosted a kind of American Idol-style search for scientists to serve as authors and editors.

Over several months, they sifted through 1,217 nominations representing 73 countries. Field's team read every nominee's resume and consulted with observer organizations and senior climate science leaders on each. "There's a full diversity of opinions," Field said, pointing out that some of those selected are outspokenly skeptical of computer climate modeling, for instance.

After participants from all IPCC countries vetted the final selections, the 310 new colleagues – including a number of Stanford researchers – were ready.

Putting the pieces together

Much of the work was done at night or on weekends. Among the authors and editors staying up late were Stanford Woods Institute Senior Fellows Terry Root, a professor, by courtesy, of biology, and David Lobell and Noah Diffenbaugh, both associate professors of environmental Earth system science. "There is no institution as richly represented as Stanford," Field said.

Stanford even hosted a U.S. government-funded office on campus, with five scientists and four technical staffers. The university also provided library research privileges for IPCC authors from developing countries.

"Stanford didn't see it as a distraction, but as a fundamental function of the university," Diffenbaugh said. His 9-year-old daughter, however, had

a different perspective. Her father, worn out from after-hours work on the assessment, would often fall asleep while reading bedtime stories.

"There were definitely a lot of late nights," Diffenbaugh said. "You want to know the answer, and you want to get it right. In that sense, it's not a punch-the-clock kind of activity." Authors were told during orientation that they should expect to devote about 25 percent of their time for three years to the report.

"Overall, it's a process designed to not let any nonsense through, so that policymakers get only the best of what science can say," said Lobell, a lead author on a chapter about food production systems and food security. "That takes a lot of checking, rechecking and outside review, which is not always the most exciting, but you do it realizing that it's part of the process."

Sometimes, it took pen sketches too. Lobell recalled a group effort to come up with a key summary figure for the chapter he worked on about food security. "We ended up doodling on napkins over dinner, and then I went back and made a version that ended up in the final report. One of the senior authors described that as the highlight of his career."

Reaching consensus

The journey to the final draft was a delicate exercise in international relations.

"It is a tough job," said Root, a review editor for a chapter on terrestrial and inland water systems. "You must be very current with the literature, and due to space constraints there are always 'battles' to include what each author thinks is important. It is wonderful, though, getting the opportunity to work with the best scientists around the world."

Root and her fellow chapter editors in Spain and Switzerland would hash out their different perspectives during early-morning conference calls. Their Skype sessions sometimes went for more than four hours.

The chapter teams pored over dozens of peer-reviewed studies, some of them from nonscientific journals, discussed and debated findings, and then settled on language they were all comfortable using. "Instead of telling your fellow scientists they were full of it, you just had to say, 'Where's the traceable evidence?' and they would change their tune," Lobell said. Still, "there was nearly always a friendly atmosphere."

"The challenge is also to communicate things clearly," he added. "For example, it doesn't help much to say, 'Things are uncertain.' It's better to say something like, 'If we knew A, we would know B, but we don't really know A.'"

With consensus on their minds, representatives of IPCC member countries met in Switzerland in late February to review the report's final draft.

"If the countries don't agree on particular text, generally the text doesn't get in there," Field said. In some cases, representatives from a small group of countries might decamp to a separate room to work out differences of opinion. "For the exceptionally rare cases where every country but one agrees on something, sometimes text will go into the report saying every country but one agrees on this."

The homestretch and beyond

Leaders in business, national security, public health, agriculture and other fields can make good use of the data, said Michael Mastrandrea, a Stanford Woods Institute consulting assistant professor. "Climate change is not just something for governments to be thinking about."

Field acknowledged that the report's continued value depends on making it more accessible and relevant to a wider audience. "There are a number of things I think the IPCC does spectacularly well. There are some things we don't do so well," he said. Field would like to see more author participation from the private sector, such as oil companies and reinsurance firms, and more integration of IPCC working groups.

Perhaps most important, Field envisions providing more user-friendly, customizable and interactive electronic data on an ongoing basis, as opposed to one massive report every six or seven years.

The report will serve as a foundation for international negotiations at events such as the U.N. Climate Leaders Summit scheduled for September. U.N. Secretary General Ban Ki-moon has called on world leaders to make "bold" pledges at the meeting and to demonstrate they will achieve ambitious emissions cuts as part of a legal agreement to be signed in early 2015. Field remains optimistic that the [report](#) can spur policy and technology that will steer the Earth toward a more sustainable future.

"Even though we face some serious challenges, we have some really attractive opportunities for building a better world in the future," Field said. "The thing we need to wrap our collective brains around is that building a better world is going to require taking advantage of the scientific knowledge and being smart about managing the risk."

Provided by Stanford University

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