

The Climate Change category leads off the sixth edition of the awards

Christopher Field wins the BBVA Foundation Frontiers of Knowledge Award for revealing the utility of ecosystem management as a weapon against climate change

- Field, a biologist, co-chairs Working Group 2 of the Intergovernmental Panel on Climate Change dealing with impacts, adaptation and vulnerability
- His insights have facilitated the design of effective strategies for managing agricultural fields, forests and other terrestrial ecosystems in the face of future climate change
- Field has hailed the award as a recognition for the whole community of climate scientists and the science of climate change

Madrid, January 9, 2014.- The BBVA Foundation Frontiers of Knowledge Award in the Climate Change category has gone in this sixth edition to U.S. biologist Christopher Field, Director of the Department of Global Ecology at the Carnegie Institution for Science and a professor at Stanford University (United States), for discovering the importance of ecosystems and their effective management in the battle against climate change. Field's work has allowed to quantify the global climate impact of deforestation, agriculture and other changes in vegetation cover. And vice versa. It has helped predict how climate change will impact on land ecosystems.

CO₂ exchange between ecosystems and the atmosphere is a full twenty times greater than human-induced emissions. Field's insights have brought this evidence to light by quantifying how ecosystems influence the amount of carbon circulating in the atmosphere. Not only that, they have shown that terrestrial

vegetation plays a part in global climate control by modifying water evaporation and the solar radiation absorbed by the planet.

It was this, the jury explains, that led to the conclusion that effective ecosystem management can aid in mitigating climate change.

In the words of the jury, the award recognizes "Field's fundamental contributions to understanding the interactions between the dynamics of plants and land ecosystems and CO₂ released through human activities."

"His visionary research on the global carbon cycle demonstrated that projections of future climate require the explicit consideration of land ecosystems and their management," the citation continues.

Among the achievements singled out by the jury is that Field has crossed the boundary from basic science to climate change impact research, and cut a leading path in liaison between scientists and policymakers.

Field is currently co-chairing Working Group 2 of the Intergovernmental Panel on Climate Change (IPCC), assessing impacts, adaptation and vulnerability in the face of climate change. This group will shortly release its fifth report – the fourth was published in 2007 – a key document which, like the rest of the IPCC's reviews, aspires to serve as input to subsequent policy decisions.

Field, who was informed of his win during an IPCC Working Group meeting in the Netherlands, declared himself "quite overcome", adding that he sees the award as "a recognition for the whole community of climate scientists, because science advances through the work of thousands of individuals." The honor, he believes, will confer more visibility on the field: "It's tremendously important for the world community to realize the importance of climate change and climate science."

In the IPCC, Field coordinates the work of hundreds of scientists all over the world, and must also debate with those responsible for signing off the report; a task he describes as "complicated but enriching." "The IPCC," he explains, "is a unique institution. Right now we are hundreds of scientists working very hard to understand what is known and not known about climate impacts and adaptations, those that have already occurred but also those predicted for the future."

Cold waves and extreme events

Field cannot give anything away about the contents of the upcoming report. Asked about whether there is scientific evidence for the link between natural disasters and climate change, he refers to an already published paper on the risk of extreme climate events: "We know for a fact that heat waves and floods will be far more common in many parts of the planet, but we are still unsure about other events, such as hurricanes. Nor can we say whether the present cold wave in the United States is due to climate change."

His role at the IPCC means he must watch his words when discussing current climate change policies: “All I can say is that I think governments should pay careful attention to the science, and use it to make smart decisions. And if I go beyond that, my main advice to governments would be to recognize the importance of climate change issues and realize that there is a wide range of opportunities that can help us build societies more resilient to the impacts.”

From photosynthesis to climate change

Field – author of over 200 highly cited scientific publications – combines his IPCC work with his own research enterprise, dating from the early 1980s and a PhD thesis on the subject of photosynthesis, which inquired whether the biochemical processes unfolding in a single leaf can yield conclusions about a whole forest. As so often happens in science, finding the right answer to one, rather narrow question has engendered multiple and important consequences. Its object may initially seem to have little to do with climate change, but in fact Field's research has proved vital to quantify photosynthesis on a global scale, to assess plants' ability to absorb carbon and act as sinks, and, in general, to understand the response of ecosystems to increased atmospheric concentrations of CO₂. Essential information, in other words, for predicting the impacts of climate change.

As the jury notes, “his contributions established the links between plant photosynthesis and the global carbon budget (...) His insights allowed the design of effective strategies for managing agricultural fields, forests and other terrestrial ecosystems in the face of future climate change, as well as strategies for mitigating climate change through the production of plant-based biofuels.”

Field pioneered the use of satellite observations to measure how much CO₂ is captured by terrestrial ecosystems worldwide – a key input in climate modeling. He has also demonstrated by means of innovative experiments – especially at Jasper Ridge, a biological preserve he helped found in the 1990s which operates as a natural laboratory – that elevated levels of CO₂ do not, as was once thought, have a fertilizing effect on plant productivity at the ecosystem scale. In fact, this productivity depends on other factors, like the availability of nitrogen.

Bio notes

Christopher Field obtained a PhD in biology in 1981 from Stanford University, where he has spent all of his professional life. In 2002, he founded the Department of Global Ecology at the Carnegie Institution for Science, which he heads to this day. A professor in the Department of Biology at Stanford since 2005, he was subsequently appointed professor in the same institution's Department of Environmental Earth System Science, and is also director of its Jasper Ridge Biological Preserve.

He has served on numerous national and international committees dealing with questions of global ecology. In particular, he was a coordinating lead author for the Fourth Assessment Report of the Intergovernmental Panel on Climate Change

(IPCC) awarded the Nobel Peace Prize in 2007. He is currently co-chair of the IPCC's Working Group 2 assessing climate change impacts, whose fifth report is due out in the coming weeks.

A "go to" expert for governments and institutions, he is an influential voice in the policy debate, as evidenced by his book *Climate Change for Policymakers and Business Leaders*, and publications like the 2012 report *Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation*, for which he was lead editor. *Nature* magazine has named him among its "Five to Watch in 2014".

The BBVA Foundation Frontiers of Knowledge Awards

The BBVA Foundation promotes, funds and disseminates world-class scientific research and artistic creation, in the conviction that science, culture and knowledge in its broadest sense hold the key to a better future for people. The Foundation designs and implements its programs in partnership with leading scientific and cultural organizations in Spain and abroad, seeking to identify and prioritize those projects with the power to move forward the frontiers of the known world.

The BBVA Foundation established its Frontiers of Knowledge Awards in 2008 to recognize the authors of outstanding contributions and radical advances in a broad range of scientific and technological areas congruent with the knowledge map of the late 20th and 21st centuries, and others that address central challenges, such as climate change and development cooperation, deserving greater visibility and recognition. Their **eight categories** include classical areas like *Basic Sciences (Physics, Chemistry and Mathematics)* and *Biomedicine*, and other, more recent areas characteristic of our time, ranging from *Information and Communication Technologies*, *Ecology and Conservation Biology*, *Climate Change* and *Economics, Finance and Management* to *Development Cooperation* and the innovative realm of artistic creation that is *Contemporary Music*.

The **juries** in each category are made up of leading international experts in their respective fields, whose involvement endorses the rigor of the awards and has accordingly been instrumental in consolidating their prestige.

The variety and quality of the **nominations** received from eminent figures in leading academic and research organizations all around the planet are an indicator of the excellent reception the Frontiers of Knowledge Awards have enjoyed from the global scientific community.

The BBVA Foundation is aided in the organization of the awards by the **Spanish National Research Council (CSIC)**, the country's premier multidisciplinary research organization. The CSIC is responsible for appointing the Technical Evaluation Committees that undertake an initial assessment of candidates and draw up a reasoned shortlist for the consideration of the juries.

In the Climate Change category, Committee members were Jordi Bascompte, CSIC Research Professor at Doñana Biological Station; Xavier Querol, CSIC Research Professor in the Institute of Environmental Assessment and Water Research; Rafael Simó, a CSIC researcher in the Institute of Marine Sciences; and Fernando Valladares, CSIC Research Professor in the Spanish Museum of Natural Sciences.

The BBVA Foundation Frontiers of Knowledge Awards, devised and organized from Spain, provide an international showcase for the best qualities of Spanish science. Their credibility, the stature of the institutions, research centers and scientists nominating and assessing candidates, and the excellence of the laureates in all editions have earned them a firm place among the world's foremost award schemes.

Climate Change jury

The jury in this category was chaired by Bjorn Stevens, Director of the Max Planck Institute for Meteorology (Germany), with Carlos Duarte, Research Professor of the Spanish National Research Council (CSIC) and Director of the UWA Oceans Institute at the University of Western Australia, acting as secretary. Remaining members were Miquel Canals, Professor of Marine Geology in the Geology School at the University of Barcelona (Spain); Sandrine Bony-Lena, senior scientist at the Laboratoire de Météorologie Dynamique (LMD), run jointly by the Centre National de la Recherche Scientifique and University Pierre et Marie Curie (France); Kirsten Halsnæs, Head of the Climate Program at the Technical University of Denmark (DTU); and Edward Rubin, Professor of Engineering and Public Policy at Carnegie Mellon University (United States).

Previous laureates

The award in last year's edition went to **Susan Solomon**, professor at Massachusetts Institute of Technology (MIT), for "having contributed, through her research and leadership, to the safeguarding of our planet," and "providing a role model of science for the public good."

The winner in the fourth edition was German-born U.S. physicist **Isaac Held**, recognized for "his fundamental and pioneering contributions to our understanding of the structure of atmospheric circulation systems and the role of water vapor in climate change."

Preceding him were the British economist **Nicholas Stern**, whose pioneering report shaped and focused the discourse on the economics of climate change and was the means to quantify the impacts and costs arising from the alteration of our planet's climate, and German physicist and mathematician **Klaus Hasselmann**, who earned the award for "developing methods which show that today's global warming is mainly attributable to human action." Finally, the winner in the

inaugural edition was **Wallace Broecker**, the U.S. scientist who alerted the world to the phenomenon of “global warming.”

UPCOMING AWARD ANNOUNCEMENTS

CATEGORY	DATE
Information and Communication Technologies (ICT)	January 14, 2014
Basic Sciences	January 21, 2014
Biomedicine	January 28, 2014
Ecology and Conservation Biology	February 4, 2014
Contemporary Music	February 11, 2014
Economics, Finance and Management	February 18, 2014
Development Cooperation	February 25, 2014

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