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## Vatican Science Panel Calls Attention to the Threat of Glacial Melt

*Pontifical Academy of Sciences working group of elite scientists to present report to Pope Benedict XVI*

A panel of some of the world's leading climate and glacier scientists co-chaired by a Scripps Institution of Oceanography, UC San Diego researcher issued a report today commissioned by the Vatican's Pontifical Academy of Sciences citing the moral imperative before society to properly address climate change.

The co-authors of "Fate of Mountain Glaciers in the Anthropocene" list numerous examples of glacial decline around the world and the evidence linking that decline to human-caused changes in climate and air pollution. The threat to the ways of life of people dependent upon glaciers and snow packs for water supplies compels immediate action to mitigate the effects of climate change and to adapt to what changes are happening now and are projected to happen in the future.

"We are committed to ensuring that all inhabitants of this planet receive their daily bread, fresh air to breathe and clean water to drink as we are aware that, if we want justice and peace, we must protect the habitat that sustains us," the authors write in a declaration prefacing the report. "The believers among us ask God to grant us this wish."

Scripps Climate and Atmospheric Scientist Veerabhadran Ramanathan co-chaired the working group with Nobel Laureate Paul Crutzen, formerly affiliated with Scripps and Lennart Bengtsson, former head of the European weather forecasting center. The group also included Nobel Laureate Carlo Rubbia, former director general of the CERN Laboratory. Among the rest of the 24 authors are Lonnie Thompson of Ohio State University, Wilfried Haeberli from Switzerland, Georg Kaser from Austria, Walter Immerzeel from the Netherlands and Anil Kulkarni from India, considered among the world's foremost experts on glacial change and mountain hydrology.

"The widespread loss of snow and ice in the mountain glaciers is one of the most visible changes attributable to global climate change. The disintegration of many small glaciers in the Himalayas is most disturbing to me since this region serves as the water tower of Asia and since both the greenhouse gases and air pollutants like soot and ozone contribute to the melting," said Ramanathan, who has been a member of the Pontifical Academy of Sciences since 2004.

Report authors met at the Vatican from April 2 to April 4, 2011 under the invitation of Chancellor Marcelo Sanchez Sorondo of the pontifical academy. The report was issued by the Vatican today and will be presented to Pope Benedict XVI.

Though scientists usually refrain from proposing action, Ramanathan said the circumstances warranted advancing suggestions from the working group. The authors recommend pursuit of three measures: immediate reduction of worldwide

carbon dioxide emissions, reduction of concentrations of warming air pollutants such as soot, ozone, methane and hydrofluorocarbons by up to 50 percent, and preparation to adapt to climate changes that society will not be able to mitigate.

The report title refers to the term coined by Crutzen to describe what is considered a new geologic epoch that began when the impacts of mankind on the planet became a major factor in environmental and climate changes.

“The recent changes observed in glacial behavior are due to a complex mix of causal factors that include greenhouse gas forcing together with large scale emissions of dark soot particles and dust in ‘brown clouds’, and the associated changes in regional atmospheric energy and moisture content, all of which result in significant warming at higher altitudes, not least in the Himalayas,” the authors write.

“Changes of mountain glaciers all around the world are rapid and impacts are expected to be detrimental, particularly in the high mountains of South America and Asia,” said Kaser, of the Institute for Meteorology and Geophysics at the University of Innsbruck. “Yet, our understanding about glacier changes in these regions is still limited and ambitious and joint efforts are required to respond to these problems. With its report, the pontifical academy contributes considerably to raising awareness.”

“Glaciers are one of our most visible evidences of global climate change,” added Thompson. “They integrate many climate variables in the Earth system. Their loss is readily apparent and they have no political agenda. Glaciers remind us of the stunning beauty of nature and in turn the urgency of doing everything in our power to protect it.”

The authors conclude: “We appeal to all nations to develop and implement, without delay, effective and fair policies to reduce the causes and impacts of climate change on communities and ecosystems, including mountain glaciers and their watersheds, aware that we all live in the same home. By acting now, in the spirit of common but differentiated responsibility, we accept our duty to one another and to the stewardship of a planet blessed with the gift of life.”