



## Climate Change Science

*Though it remains technically possible to keep planetary warming to a tolerable level, only an intensive push over the next 15 years to bring emissions under control can achieve the goal, the Intergovernmental Panel on Climate Change (IPCC) committee found. "We cannot afford to lose another decade," said Ottmar Edenhofer, a German economist and co-chairman of the committee that wrote the report. "If we lose another decade, it becomes extremely costly to achieve climate stabilization."*

Climate change is already having a profound impact on our nation. For people of faith, this is one of the most urgent moral issues of our time. We are called to love and steward Creation, and to care for the most vulnerable among us, who are most at risk. We have a moral responsibility to leave a safe climate and sustainable environment for our children and future generations.

Continued inaction in addressing carbon emissions will likely lead to 9°F warming (or higher) for most of the U.S., resulting in faster sea level rise, more extreme weather, and collapse of the permafrost sink, which would further accelerate warming. This level of warming would in turn lead to a "breakdown of food systems," more violent conflicts, and ultimately threaten to make some currently habited and arable land virtually unlivable for parts of the year. The cost of keeping emissions low enough to avoid potentially catastrophic outcomes would reduce the median annual growth of consumption over this century by a mere 0.06%, and this does not count the considerable economic benefits of doing so.

According to recent reports from the National Climate Assessment (NCA) and the Intergovernmental Panel on Climate Change (IPCC):

**The world must phase-out of fossil fuels and shift to clean energy investments.** While global emissions are still growing, some modern and innovative economies have already beaten the trend - moving from dirty fossil fuels to renewable energies, proving it can be done.

**Urban areas are expected to triple by 2030.** This is directly relevant to climate change as urban areas account for roughly 70% of global energy use and global energy-related CO<sub>2</sub> emissions. Since much of this urban infrastructure will be built in the next 20 years, there is massive potential for smart infrastructure choices, combined with low energy codes in new buildings, retrofits of the existing housing stock and more widespread use of already existing technologies and efficiencies.

**Forests, agriculture, and land use could become a net CO<sub>2</sub> sink by the end of the century.** These sectors currently account for about quarter of global greenhouse gas emissions,

and could become a net CO2 sink due to successful afforestation efforts, reduced deforestation, and better agricultural practices.

**Energy efficiency offers massive potential and multiple benefits**, as well as the need for improved demand side management. Of course it's vital to produce energy in a more sustainable way, but saving energy in the first place and avoiding unnecessary waste is even better.

**Climate change is expected to continue and accelerate significantly this century — 5°F to 10°F warmer** — if human-induced emissions from burning fossil fuels, such as oil and coal, continue to increase at the present rate.

**Widespread climate-related weather extremes are occurring now and will get worse.** A 1.5°F increase is already causing extreme weather events in the U.S. and globally, such as longer heat waves, wildfires, more heavy downpours, and more severe droughts.

**Reliability of water supplies is being reduced by climate change.** Surface and groundwater supplies in many regions are already stressed by increasing demand for water as well as declining runoff and groundwater recharge.

**Crop and livestock production will be increasingly challenged.** Increased heat, pests, water stress, diseases, and weather extremes will pose adaptation challenges for crop and livestock production. Yields of major U.S. crops are expected to decline, threatening both U.S. and international food security.

**Infrastructure across the U.S. is being adversely affected by climate change**, already resulting in weather- and flood-related damage to roads, buildings, ports, and energy facilities.

**Life in the oceans is becoming increasingly stressed as ocean waters become warmer and more acidic.** Warming ocean waters and ocean acidification from absorbed carbon pollution are broadly affecting marine life.

**Coastal areas are at increasing risk from sea-level rise and storm surge.** Many U.S. coastal areas are at increasing risk of erosion and flooding.